

In re Patent Application of:

AMMAR

Serial No. **Not Yet Assigned**

Filed: **Herewith**

In the Claims:

Please cancel Claims 1-20.

Please add new Claims 21-40 as follows:

21. A millimeter wave transceiver module comprising:
a single thick-film board comprising a plurality of
layers; and
one or more microwave monolithic integrated circuit
(MMIC) chips connected to said substrate board and operable to
transmit and receive millimeter wavelength radio frequency
(RF) signals, wherein said MMIC chips are formed into one or
more chip packages.

22. A millimeter wave transceiver module according to
claim 21, wherein said one or more chip packages comprises a
receive MMIC chip package, a transmitter MMIC chip package,
and a local oscillator (LO) multiplier MMIC chip package.

23. A millimeter wave transceiver module according to
claim 22, wherein said receiver MMIC chip package, said
transmitter MMIC chip package, and said local oscillator (LO)
multiplier MMIC chip package are formed into a transceiver
chip set.

24. A millimeter wave transceiver module according to
claim 23, wherein said transceiver chip set measures no more
than about 0.2 to about 0.25 inches.

In re Patent Application of:

AMMAR

Serial No. **Not Yet Assigned**

Filed: **Herewith**

25. A millimeter wave transceiver module according to claim 23, wherein said receiver MMIC chip package comprises a multilayer thick film substrate board.

26. A millimeter wave transceiver module according to claim 25, wherein said multilayer thick film substrate board comprises ceramic film.

27. A millimeter wave (MMW) radio frequency transceiver module comprising:

a substrate board;

a plurality of microwave monolithic integrated circuit (MMIC) chips supported by the substrate board and arranged in a receiver section, a local oscillator section, and a transmitter section; and

a plurality of filters and radio frequency interconnects formed on the substrate board and operative with and/or connecting the receiver, local oscillator and transmitter sections.

28. A millimeter wave (MMW) radio frequency transceiver module according to Claim 27, and further comprising electrical interconnects that are printed on the substrate board.

29. A millimeter wave (MMW) radio frequency transceiver module according to Claim 27, and further comprising a cutout formed within the substrate for receiving a MMIC chip for allowing direct attachment of the MMIC chip to a coefficient of thermal expansion (CTE) matched carrier or heat sink.

In re Patent Application of:

AMMAR

Serial No. **Not Yet Assigned**

Filed: **Herewith**

30. A millimeter wave (MMW) radio frequency transceiver module according to Claim 27, and further comprising at least one row of ground vias formed within the substrate board and providing isolation between at least the transmitter and the receiver sections formed on the substrate board.

31. A millimeter wave (MMW) radio frequency transceiver module according to Claim 27, wherein said transmitter, receiver and local oscillator sections are formed separated and sectioned from each other to enhance isolation and reduce oscillations.

32. A millimeter wave (MMW) radio frequency transceiver module comprising:

housing having a bottom plate and housing cover attached to the bottom plate

a substrate board positioned on the bottom plate and covered by the housing cover;

a plurality of microwave monolithic integrated circuit (MMIC) chips supported by the substrate board and arranged in a receiver section, a local oscillator section, and a transmitter section; and

a plurality of filters and radio frequency interconnects formed on the substrate board and operative with and/or connecting the receiver, local oscillator and transmitter sections.

33. A millimeter wave (MMW) radio frequency transceiver module according to Claim 32, and further comprising electrical interconnects that are printed on the substrate board.

In re Patent Application of:
AMMAR
Serial No. **Not Yet Assigned**
Filed: **Herewith**

34. A millimeter wave (MMW) radio frequency transceiver module according to Claim 32, and further comprising a cutout formed within the substrate for receiving a MMIC chip for allowing direct attachment of the MMIC chip to a coefficient of thermal expansion (CTE) matched carrier or heat sink.

35. A millimeter wave (MMW) radio frequency transceiver module according to Claim 32, and further comprising at least one row of ground vias formed within the substrate board and providing isolation between at least the transmitter and the receiver sections formed on the substrate board.

36. A millimeter wave (MMW) radio frequency transceiver module according to Claim 32, wherein said transmitter, receiver and local oscillator sections are formed substantially separated and sectioned from each other to enhance isolation and reduce oscillations.

37. A method of forming a millimeter wave (MMW) radio frequency transceiver module comprising the steps of:

forming a substrate board;

mounting a plurality of microwave monolithic integrated circuit (MMIC) chips on the substrate board such that the MMIC chips are arranged in a receiver section, a transmitter section and a local oscillator section;

forming a plurality of filters, radio frequency, and electrical interconnects that are operative with the receiver, local oscillator and transmitter sections.

In re Patent Application of:

AMMAR

Serial No. **Not Yet Assigned**

Filed: **Herewith**

38. A method according to Claim 37, and further comprising the step of forming the transmitter, receiver, and local oscillator sections separated and sectioned from each other.

39. A method according to Claim 37, and further comprising the step of forming ground vias to provide isolation between at least the transmitter and receiver sections.

40. A method according to Claim 37, and further comprising the step of forming the substrate board from multilayer thick film ceramic material.